



Impact of taping combined with stretching exercises on pain and foot function in individuals with plantar fasciitis: A case series

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Abstract

Background: Plantar fasciitis is a common cause of heel pain that is experienced in orthopaedic and rehabilitation practice. Despite the common prescription of stretching exercises, the adjunctive effect of taping to the enhancement of pain and functional results is not fully established.

Objective: To compare the impact of foot taping and stretching activity on pain and foot activity in people with plantar fasciitis.

Methods: An outpatient rehabilitation was used as a prospective case series. Foot/arch taping was applied and a structured stretching programme was offered to ten plantar fasciitis patients with a clinically determined diagnosis/problem. The baseline and post intervention measurement of the intensity of pain was done using the Visual Analogue Scale (VAS) and the foot-related functioning using the foot Function Index (FFI).

Results: Every member was found to have experienced a reduction of the heel pain and an increase in foot functioning. The average pain on the VAS of the intervention group was reduced by about 55% and FFI scores were improved by about 45%. There were greater improvements among the participants who had a shorter time of symptoms and were more adherent to the programme at home. None of the adverse events were serious.

Conclusion: Taping and stretching exercises yielded clinically significant effects in pain and foot functioning in patients with plantar fasciitis. This technique can be used as a useful add-on to conservative treatment in orthopaedic rehabilitation units.

Keywords: Plantar fasciitis, taping, stretching exercises, heel pain, foot function, rehabilitation

Introduction

Plantar fasciitis is a disease that causes much of the plantar heel pain and it represents a significant percentage of foot related complaints in orthopaedic outpatient practice^[6, 7]. It is marked by discomfort at the medial calcaneal tubercle that is normally aggravated in the initial strides of a rest or prolonged standing^[7]. It is a multifactorial in nature with the associated factors including restricted ankle dorsiflexion, gastro-soleus tightness, elevated body mass index, long-term weight-bearing and modified foot biomechanics^[1, 6].

The primary and primary form of treatment is known as conservative management and encompasses stretching exercises, taping, orthosis, activity modification, and patient education^[2, 6]. Clinical practice guidelines recommend stretching of plantar fascia and calf musculature; nevertheless, the effects of this technique on functional outcomes in the absence of supplements are not consistent^[3]. The goal of the techniques of temporary plantar fascia support by taping is to achieve temporary support and mechanical load reduction of the plantar fascia, which may facilitate the initial pain relief and enhanced rehabilitation participation^[5, 9].

Past research and systematic reviews have proposed that taping can be used to achieve short-term reductions in pain and that using a combination of taping and stretching can be effective^[10, 9]. However, there is limited evidence in the pragmatic clinical settings. Thus, this case series was to investigate the synergies of the effect of taping and stretching exercises on pain and foot functions in plantar

fasciitis patients treated in the context of a rehabilitation-centred orthopaedic care environment.

Materials and methods

Study design

Prospective case series with pre- and post-intervention assessment.

Study setting

Outpatient Physiotherapy Department, Maharaja Agrasen Medical College, Agroha, Hisar, India.

Participants

Ten individuals (5 males, 5 females; age range 20–52 years) with clinically diagnosed plantar fasciitis were included using purposive sampling.

Inclusion criteria

- Age 20–50 years
- Both sexes
- Positive Windlass test in weight-bearing^[3, 7]

Exclusion criteria

- History of lower limb fracture or surgery^[8]
- Congenital foot deformities or tumours
- Systemic inflammatory disease
- Prior corticosteroid injection to the heel^[6]
- Contraindications to taping or manual therapy

Intervention

All participants received a combined intervention for four weeks comprising:

- **Foot/arch taping:** Rigid or kinesiology tape applied according to individual foot biomechanics, worn for 3–5 days per week ^[5, 9]

Stretching exercises

- Gastrocnemius and soleus stretching
- Plantar fascia-specific stretching ^[3]
- Performed twice daily

Participants were also advised on footwear modification, avoidance of barefoot walking on hard surfaces, and adherence to a home exercise programme ^[6, 8].

Outcome Measures

- **Pain intensity:** Visual Analogue Scale (VAS; 0–10)
- **Foot function:** Foot Function Index (FFI) ^[6]

Assessments were recorded at baseline and at the end of the four-week intervention period.

Ethical Considerations

Written informed consent was obtained from all participants. Institutional ethical approval was secured prior to study commencement.

Results

Ten subjects showed the enhancement of pain and functional outcomes after the combined intervention. The mean VAS scores reduced by about 55 percent compared to the baseline, which showed that there was significant reduction in heel pain. The functional assessment based on FFI demonstrated that the improvement was about 45%.

Individuals whose symptom duration was less than eight weeks and whose adherence to the home programme was more experienced more pain and disability. Minor skin irritation associated with taping was noted in two cases and improved without treatment ^[6, 9]. There were no severe side effects.

Discussion

This case series can be found to have a contribution to make in that it indicates that using a combination of taping and stretching exercise can lead to clinically significant pain and foot functional changes in people with plantar fasciitis. These findings are similar to other controlled studies which reveal a short-term analgesic effect of taping and a possible synergistic effect with stretching ^[5, 9, 10].

Biomechanically, the use of taping can offer instant mechanical loading off-loading of the plantar fascia, thereby decreasing the pressure of weight-bearing tasks ^[5, 9]. Early pain management can help promote better activities during the stretching exercises which are aimed at addressing underlying soft-tissue tightness and limited range of ankle dorsiflexion ^[3].

The more significant changes in the participants who reported a shorter length of symptoms indicate the need to use conservative interventions at an early stage of plantar fasciitis. Also, the compliance with home exercise programme seemed to be a decisive factor in functional recovery that contributed to the worth of patient education and self-management skills within the context of orthopaedic rehabilitation ^[2, 8].

Limitations

Some limitations associated with this study are the lack of control group, lack of a large sample and short-term follow-up. Since this is a case series, there is no way of determining causal relationships. Outcomes that were measured were not determined after four weeks.

Conclusion

The use of the combination of taping and stretching exercises in this case series lead to meaningful reductions of pain and the improvement of the foot function in people with plantar fasciitis. The combined method can be regarded as an effective supplement of the conservative treatment of plantar fasciitis in the orthopaedic practice. More randomized controlled trials and with bigger samples and time follow up are justified.

Conflict of Interest

The authors declare no conflict of interest.

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Author contributions

All authors contributed to the conception, design, drafting, and revision of this review.

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